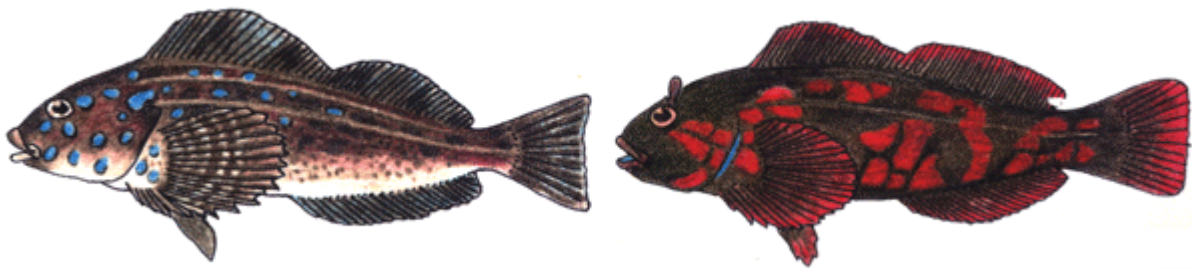


Kelp Greenling, *Hexagrammos decagrammus*
Rock Greenling, *Hexagrammos lagocephalus*
Whitespotted Greenling, *Hexagrammos sterelli*
1993-1999 Commercial Catch by Ports & Blocks



Marine Fishery Profiles
Volume 1: Nearshore

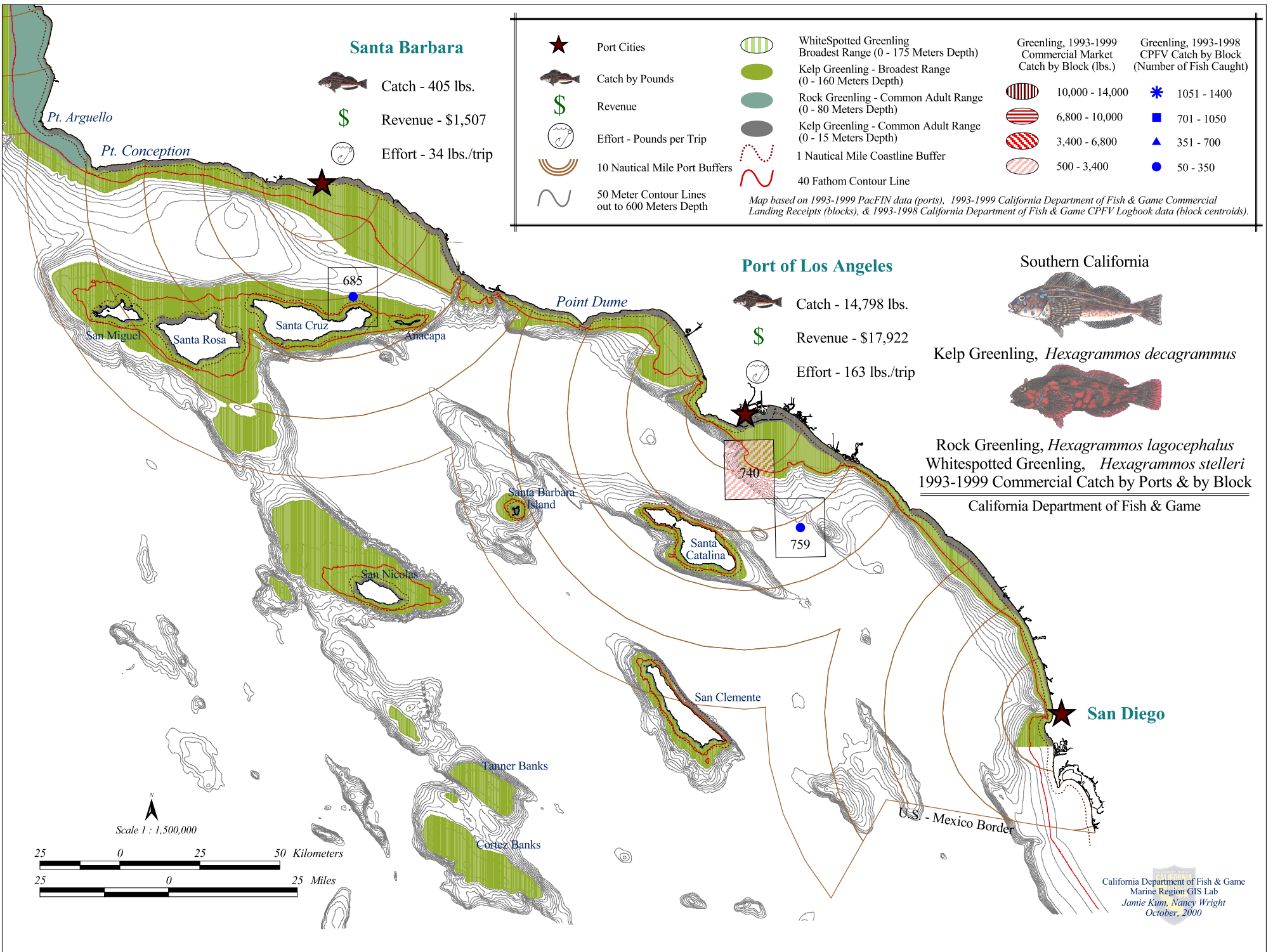
Marine Region GIS Lab

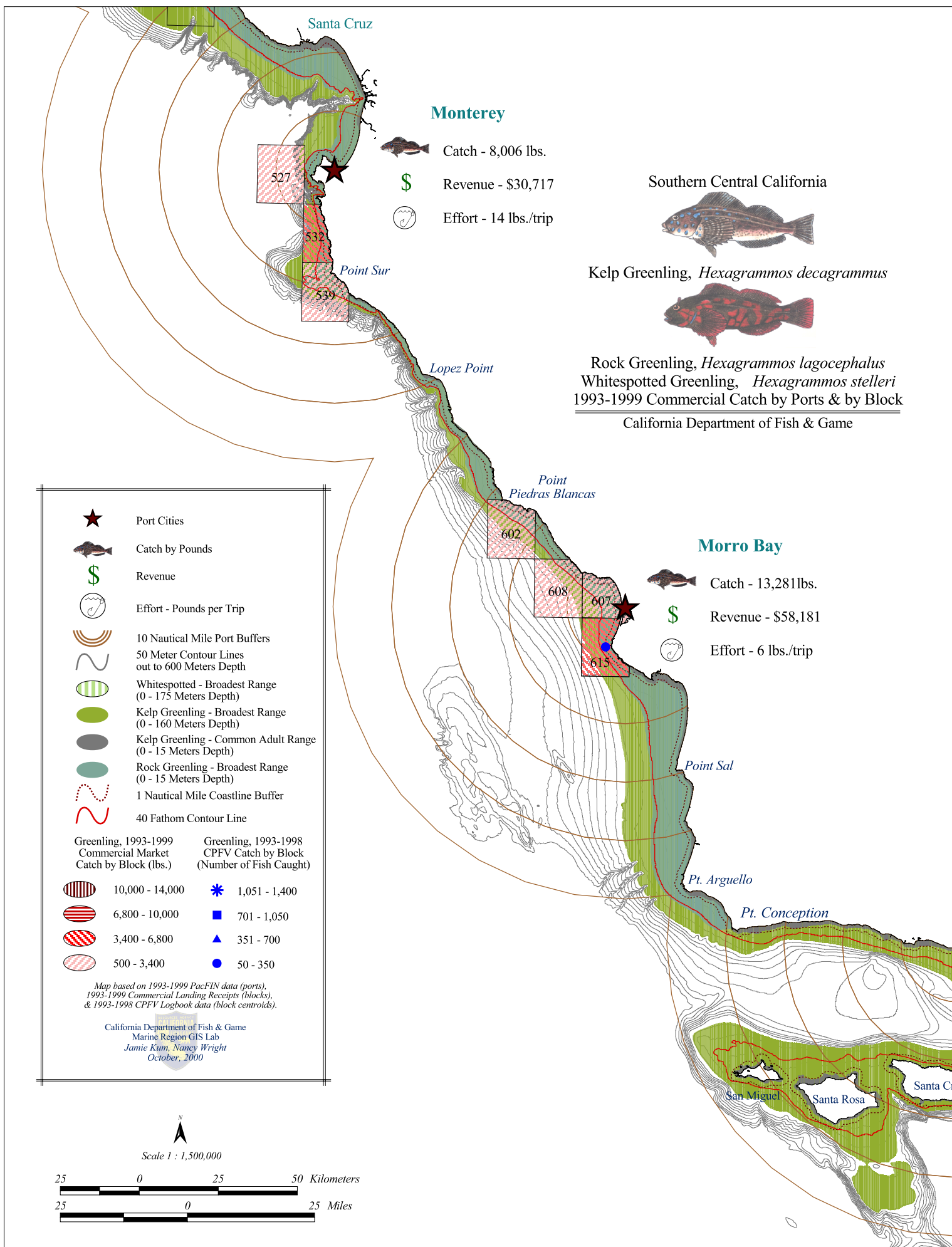
Nancy Wright	Eric Knaggs
Jamie Kum	Bob Leos
Chad King	Colleena Perez

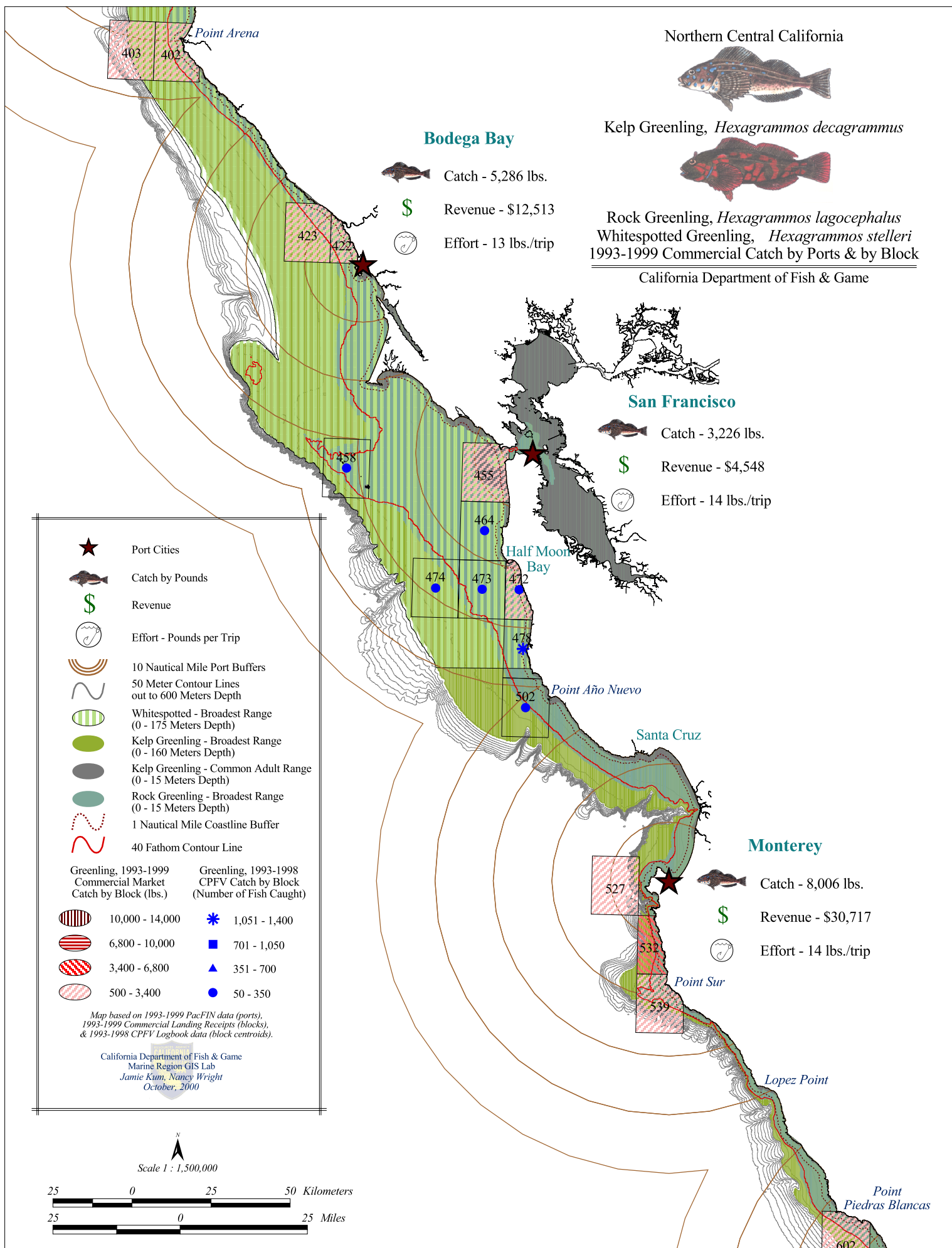


California Department of Fish & Game
Marine Region

December 2000







Northern California



Kelp Greenling, *Hexagrammos decagrammus*

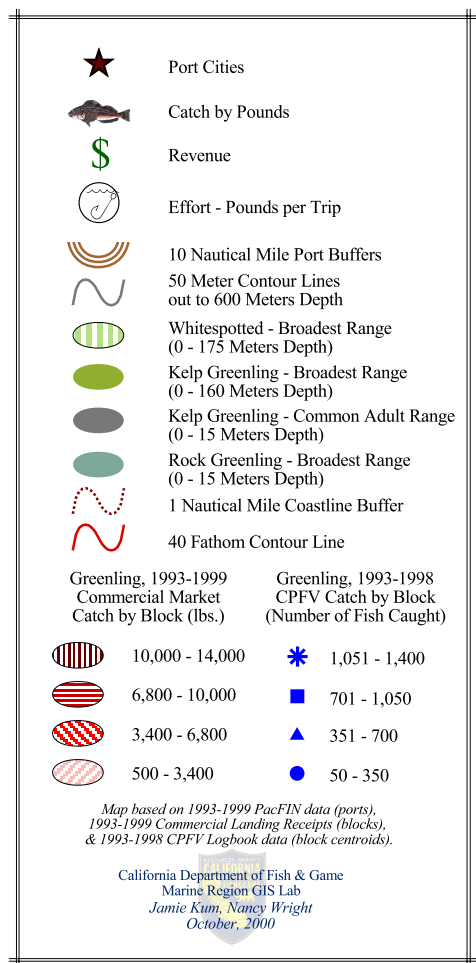


Rock Greenling, *Hexagrammos lagocephalus*

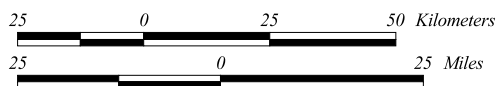
Whitespotted Greenling, *Hexagrammos stelleri*

1993-1999 Commercial Catch by Ports & by Block

California Department of Fish & Game



Scale 1 : 1,500,000



Crescent City



Catch - 13,613 lbs.



Revenue - \$40,744



Effort - 21 lbs./trip

Eureka



Catch - 6,454 lbs.



Revenue - \$8,832



Effort - 170 lbs./trip

Cape Mendocino

Punta Gorda

Fort Bragg



Catch - 29,776 lbs.



Revenue - \$101,681



Effort - 14 lbs./trip

Point Arena

Figure 1. (refer to table 1) CDFG Commercial Receipts Data (1993 - 1999)
Total Pounds of Kelp Greenling Caught and Average Price per Pound by Month

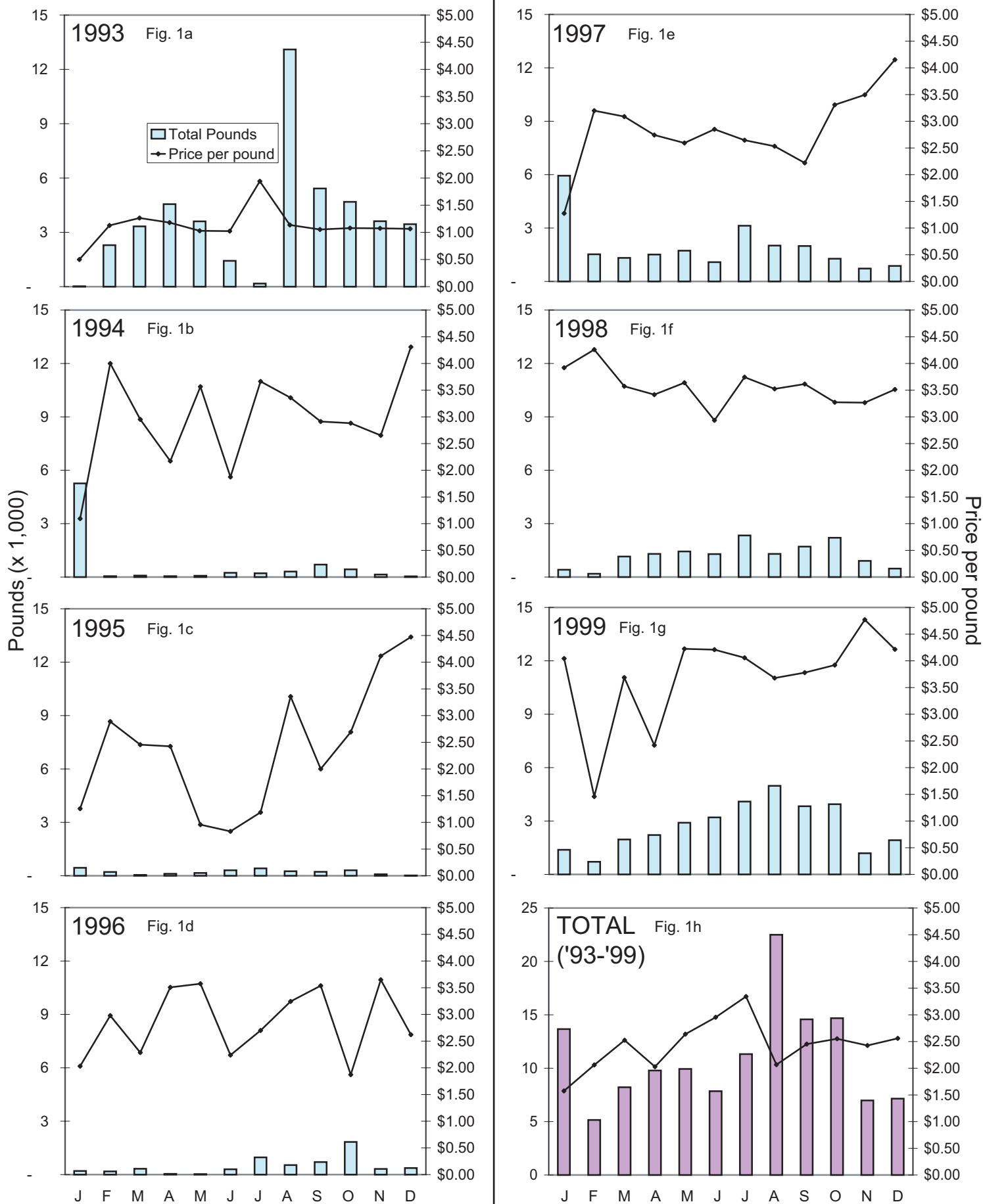


Table 1. (refer to fig. 1) CDFG Commercial Receipts Data (1993 - 1999)
Total Pounds of Kelp Greenling Caught and Average Price per Pound by Month

1993
Table 1a

Month	Total Pounds	Price per Pound
Jan	16	\$0.50
Feb	2,292	\$1.13
Mar	3,328	\$1.26
Apr	4,557	\$1.18
May	3,605	\$1.03
Jun	1,426	\$1.02
Jul	170	\$1.94
Aug	13,101	\$1.13
Sep	5,424	\$1.05
Oct	4,683	\$1.08
Nov	3,613	\$1.07
Dec	3,451	\$1.06
Total	45,666	\$1.11

1997
Table 1e

Month	Total Pounds	Price per Pound
Jan	5,941	\$1.28
Feb	1,526	\$3.20
Mar	1,321	\$3.09
Apr	1,513	\$2.74
May	1,729	\$2.59
Jun	1,084	\$2.85
Jul	3,128	\$2.65
Aug	2,014	\$2.53
Sep	1,989	\$2.22
Oct	1,277	\$3.31
Nov	723	\$3.49
Dec	872	\$4.15
Total	23,118	\$2.44

1994
Table 1b

Month	Total Pounds	Price per Pound
Jan	5,262	\$1.09
Feb	50	\$4.00
Mar	82	\$2.95
Apr	52	\$2.17
May	74	\$3.56
Jun	240	\$1.87
Jul	210	\$3.66
Aug	310	\$3.36
Sep	701	\$2.91
Oct	432	\$2.88
Nov	144	\$2.65
Dec	42	\$4.31
Total	7,599	\$1.67

1998
Table 1f

Month	Total Pounds	Price per Pound
Jan	412	\$3.92
Feb	183	\$4.26
Mar	1,153	\$3.57
Apr	1,299	\$3.42
May	1,439	\$3.64
Jun	1,291	\$2.94
Jul	2,337	\$3.74
Aug	1,299	\$3.52
Sep	1,712	\$3.61
Oct	2,207	\$3.27
Nov	910	\$3.27
Dec	474	\$3.51
Total	14,716	\$3.49

1995
Table 1c

Month	Total Pounds	Price per Pound
Jan	447	\$1.26
Feb	211	\$2.89
Mar	45	\$2.45
Apr	111	\$2.42
May	155	\$0.96
Jun	308	\$0.83
Jul	414	\$1.19
Aug	255	\$3.36
Sep	220	\$2.00
Oct	308	\$2.69
Nov	84	\$4.11
Dec	18	\$4.47
Total	2,577	\$1.94

1999
Table 1g

Month	Total Pounds	Price per Pound
Jan	1,382	\$4.04
Feb	712	\$1.46
Mar	1,962	\$3.69
Apr	2,212	\$2.42
May	2,902	\$4.22
Jun	3,201	\$4.21
Jul	4,092	\$4.06
Aug	4,977	\$3.68
Sep	3,830	\$3.78
Oct	3,946	\$3.92
Nov	1,188	\$4.77
Dec	1,922	\$4.22
Total	32,326	\$3.82

1996
Table 1d

Month	Total Pounds	Price per Pound
Jan	201	\$2.03
Feb	179	\$2.98
Mar	327	\$2.29
Apr	40	\$3.51
May	26	\$3.57
Jun	300	\$2.24
Jul	967	\$2.70
Aug	536	\$3.24
Sep	703	\$3.54
Oct	1,833	\$1.87
Nov	318	\$3.65
Dec	371	\$2.62
Total	5,800	\$2.58

TOTAL
'93 - '99
Table 1h

Month	Total Pounds	Price per Pound
Jan	13,662	\$1.57
Feb	5,153	\$2.06
Mar	8,218	\$2.52
Apr	9,784	\$2.03
May	9,928	\$2.64
Jun	7,851	\$2.95
Jul	11,319	\$3.34
Aug	22,492	\$2.07
Sep	14,579	\$2.45
Oct	14,686	\$2.55
Nov	6,980	\$2.43
Dec	7,150	\$2.56
Total	131,801	\$2.39

Figure 2. (refer to table 2) Pacific Fisheries Information Network Data (1993 - 1999)
Total Pounds of Kelp Greenling Caught and Average Price per Pound by Month

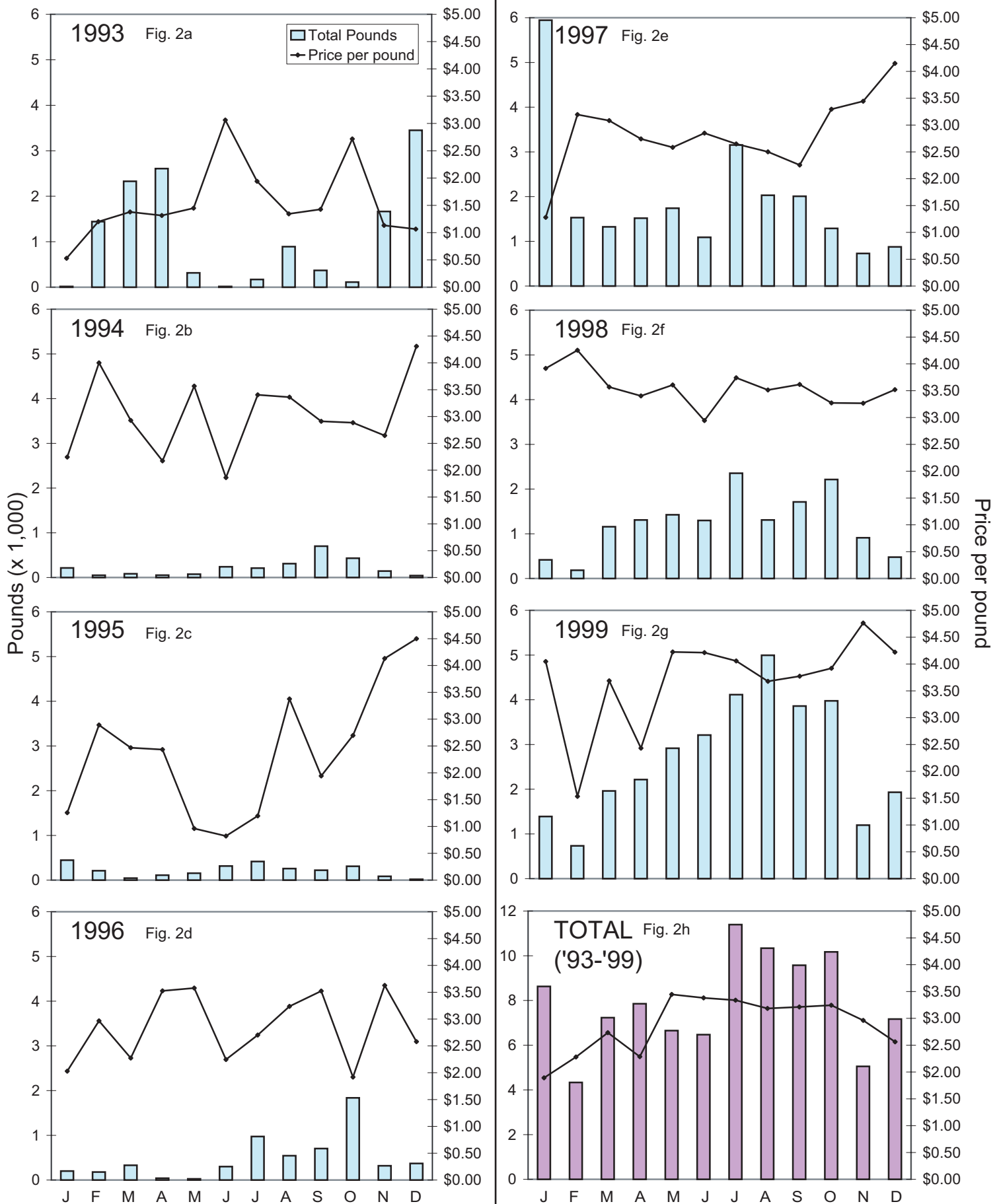


Table 2. (refer to fig. 2) Pacific Coast Fisheries Information Network Data (1993 - 1999)
Total Pounds of Kelp Greenling Caught and Average Price per Pound by Month

1993
Table 2a

Month	Total Pounds	Price per Pound
Jan	17	\$0.53
Feb	1,442	\$1.20
Mar	2,328	\$1.38
Apr	2,607	\$1.31
May	315	\$1.45
Jun	16	\$3.06
Jul	170	\$1.94
Aug	891	\$1.34
Sep	370	\$1.43
Oct	113	\$2.72
Nov	1,666	\$1.13
Dec	3,451	\$1.06
Total	13,386	\$1.26

1997
Table 2e

Month	Total Pounds	Price per Pound
Jan	5,944	\$1.28
Feb	1,530	\$3.20
Mar	1,324	\$3.08
Apr	1,517	\$2.74
May	1,740	\$2.58
Jun	1,089	\$2.85
Jul	3,154	\$2.65
Aug	2,029	\$2.50
Sep	2,007	\$2.26
Oct	1,289	\$3.29
Nov	728	\$3.44
Dec	876	\$4.15
Total	23,227	\$2.44

1994
Table 2b

Month	Total Pounds	Price per Pound
Jan	213	\$2.24
Feb	50	\$4.00
Mar	83	\$2.93
Apr	52	\$2.17
May	74	\$3.57
Jun	240	\$1.86
Jul	210	\$3.40
Aug	310	\$3.36
Sep	700	\$2.91
Oct	432	\$2.88
Nov	144	\$2.65
Dec	42	\$4.31
Total	2,550	\$2.88

1998
Table 2f

Month	Total Pounds	Price per Pound
Jan	416	\$3.92
Feb	185	\$4.25
Mar	1,157	\$3.57
Apr	1,309	\$3.40
May	1,424	\$3.61
Jun	1,298	\$2.94
Jul	2,354	\$3.74
Aug	1,309	\$3.51
Sep	1,713	\$3.62
Oct	2,213	\$3.27
Nov	911	\$3.27
Dec	477	\$3.52
Total	14,766	\$3.48

1995
Table 2c

Month	Total Pounds	Price per Pound
Jan	447	\$1.26
Feb	211	\$2.89
Mar	45	\$2.47
Apr	111	\$2.43
May	155	\$0.96
Jun	315	\$0.82
Jul	416	\$1.20
Aug	258	\$3.38
Sep	221	\$1.94
Oct	309	\$2.70
Nov	84	\$4.13
Dec	18	\$4.50
Total	2,590	\$1.94

1999
Table 2g

Month	Total Pounds	Price per Pound
Jan	1,389	\$4.05
Feb	734	\$1.53
Mar	1,961	\$3.69
Apr	2,215	\$2.43
May	2,916	\$4.22
Jun	3,211	\$4.21
Jul	4,114	\$4.06
Aug	4,996	\$3.68
Sep	3,859	\$3.77
Oct	3,976	\$3.92
Nov	1,197	\$4.76
Dec	1,931	\$4.22
Total	32,499	\$3.82

1996
Table 2d

Month	Total Pounds	Price per Pound
Jan	201	\$2.03
Feb	179	\$2.97
Mar	330	\$2.27
Apr	40	\$3.53
May	26	\$3.58
Jun	301	\$2.25
Jul	973	\$2.70
Aug	544	\$3.24
Sep	705	\$3.52
Oct	1,838	\$1.92
Nov	319	\$3.63
Dec	371	\$2.58
Total	5,827	\$2.59

TOTAL
'93 - '99
Table 2h

Month	Total Pounds	Price per Pound
Jan	8,627	\$1.89
Feb	4,331	\$2.28
Mar	7,228	\$2.73
Apr	7,851	\$2.29
May	6,650	\$3.45
Jun	6,470	\$3.38
Jul	11,391	\$3.34
Aug	10,337	\$3.18
Sep	9,575	\$3.21
Oct	10,170	\$3.24
Nov	5,049	\$2.96
Dec	7,166	\$2.56
Total	94,845	\$2.92

Figure 3.(refer to table 3) Commercial Passenger Fishing Vessel Data (1993 - 1998)
Total Number of Kelp Greenling Caught and Catch per 100 Angler Hours (CPUE)

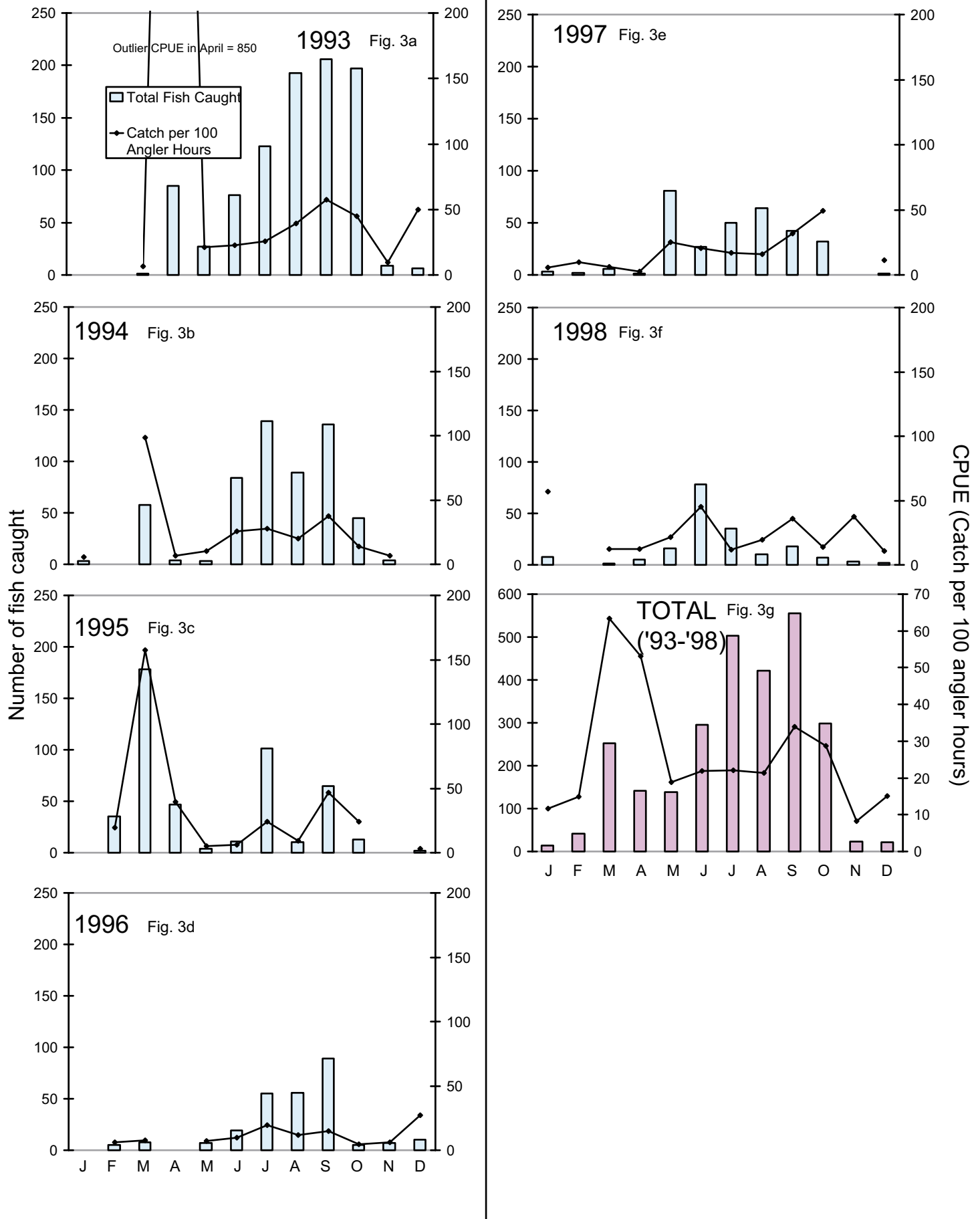


Table 3. (refer to fig. 3) Commercial Passenger Fishing Vessel Data (1993 - 1998)
Total Number of Kelp Greenling Caught and *Catch per 100 Angler Hours (CPUE)

1993
Table 3a

Month	No. Fish Caught	CPUE*
Jan	no data	no data
Feb	no data	no data
Mar	1	6.67
Apr	85	850.00
May	27	20.93
Jun	76	22.62
Jul	123	25.52
Aug	193	39.31
Sep	206	57.38
Oct	197	45.08
Nov	9	9.47
Dec	6	50.00
Total	923	39.01

1997
Table 3e

Month	No. Fish Caught	CPUE*
Jan	3	5.56
Feb	2	9.52
Mar	6	6.00
Apr	1	2.70
May	81	25.23
Jun	27	20.45
Jul	50	17.06
Aug	64	16.04
Sep	42	31.58
Oct	32	49.23
Nov	no data	no data
Dec	1	11.11
Total	309	19.76

1994
Table 3b

Month	No. Fish Caught	CPUE*
Jan	3	5.77
Feb	no data	no data
Mar	58	98.31
Apr	4	6.67
May	3	10.34
Jun	84	25.45
Jul	139	27.86
Aug	89	20.00
Sep	136	37.67
Oct	45	13.64
Nov	4	6.56
Dec	no data	no data
Total	565	25.38

1998
Table 3f

Month	No. Fish Caught	CPUE*
Jan	8	57.14
Feb	no data	no data
Mar	1	12.50
Apr	5	12.20
May	16	21.62
Jun	78	45.09
Jul	35	11.74
Aug	10	19.61
Sep	18	36.00
Oct	7	14.00
Nov	3	37.50
Dec	2	10.53
Total	183	23.28

1995
Table 3c

Month	No. Fish Caught	CPUE*
Jan	no data	no data
Feb	35	19.23
Mar	178	157.52
Apr	47	39.50
May	4	4.94
Jun	11	6.04
Jul	101	23.99
Aug	10	9.01
Sep	65	46.43
Oct	13	24.07
Nov	no data	no data
Dec	2	3.23
Total	466	31.81

TOTAL
'93 - '98
Table 3g

Month	No. Fish Caught	CPUE*
Jan	14	11.67
Feb	42	14.84
Mar	252	63.32
Apr	142	53.18
May	138	18.90
Jun	295	21.90
Jul	503	22.09
Aug	422	21.39
Sep	556	33.84
Oct	299	28.67
Nov	23	8.24
Dec	21	15.11
Total	2,707	25.78

1996
Table 3d

Month	No. Fish Caught	CPUE*
Jan	no data	no data
Feb	5	6.25
Mar	8	7.77
Apr	no data	no data
May	7	7.29
Jun	19	9.79
Jul	55	19.37
Aug	56	11.76
Sep	89	14.83
Oct	5	4.67
Nov	7	6.09
Dec	10	27.03
Total	261	12.48

Abbreviated Life History of the Kelp Greenling (*Hexagrammos decagrammus*)

The kelp greenling is in the family of Hexagrammidae and shares this taxonomic relationship with lingcod. The kelp greenling is one of the most conspicuous fishes in rocky nearshore habitats, occurring often in and around kelp beds. The male and female look so different that they were first described as separate species. The body color is variable in both sexes, ranging from light gray to brown. Males, however, have large irregular blue patches anteriorly, while females are uniformly covered with smaller dark spots.

Distribution, Stock Structure and Migration

Populations range along the eastern Pacific coast from La Jolla, California to the Aleutian Islands in Alaska. Kelp greenlings are not known to migrate; on the contrary, adults are often territorial, particularly during spawning season.

Age and Growth

Kelp greenlings grow faster than most nearshore fishes during their first three years. They have been aged to a maximum of 8 yr for males and 13 yr for females. Total lengths corresponding to the male and female ages were 15.0 in. and 17.4 in., respectively. The largest recorded size is 21 in. TL.

Reproduction, Fecundity and Seasonality

Approximately one third of all male kelp greenling are sexually mature at age 2, while half of all males are mature by age 3-4 at an average total length of 11.6 inches. Approximately one half to two thirds of all females kelp greenling are sexually mature at age 3-4 at an average total length of 11.6 inches. In California, the spawning season for kelp greenling occurs from September through December. Females spawn their eggs subtidally on rocks. Their egg nests have been observed at depths of 16 to 56 feet. An individual male kelp greenling may guard up to 11 egg masses simultaneously, although the average number is four. Hatching occurs from December through February in northern California. Larvae are approximately 0.3 to 0.4 in. long at hatching and remain as planktonic organisms up to a total length of 2.0 to 2.7 inches.

Natural Mortality

Estimates of natural mortality are not available.

Diseases

No information is available concerning diseases in kelp greenling.

***Predator/Prey
Relationships***

Kelp greenling larvae prey on a wide variety of planktonic organisms, including fish larvae and eggs. During most of the year, juveniles and adults consume a variety of prey that is consistently available in the habitat, including crabs, shrimp, snails, chiton, abalones, octopi, fish, fish eggs, and algae. There are brief periods when organisms such as juvenile fishes or herring spawn become exceptionally abundant, and kelp greenling shift their food habits to take advantage of these opportunities. The primary predators of adult greenling are lingcod and harbor seal.

Competition

Based on co-occurrence with adult and juvenile kelp greenling, demersal fishes associated with kelp beds and reef structure likely to compete with kelp greenling for food and space would include lingcod, cabezon, and rockfish species such as grass, gopher, black-and-yellow, China, quillback, copper, and vermillion.

Critical Habitat

Kelp greenling range in depth from the intertidal to approximately 500 ft deep but are more common at depths of 150 ft or less. Fish frequent subtidal habitats in or around rocky reef areas and under kelp beds. Juveniles and adults both are common on any rocky bottom area with dense algal growth.

Status of Stocks

There are no estimates of abundance for kelp greenling in California.

Abbreviated Life History of the Rock Greenling (*Hexagrammos lagocephalus*)

The rock greenling is in the family Hexagrammidae and is closely related to the kelp greenling, both taxonomically and morphologically. It is reddish-brown with darker mottling and often has large bright-red blotches on the sides. The inside of the mouth is bluish.

Distribution, Stock Structure and Migration

The rock greenling ranges from the Bering Sea to Point Conception, but also occurs in the western Pacific Ocean south to Japan. In California, this species is infrequently observed south of San Francisco. Little is known about their stock structure. Similar to kelp greenling, adults are territorial.

Age and Growth

No data are available from California. Rock greenlings have been aged to a maximum of 8 yr for males and 11 yr for females. Total lengths corresponding to these male and female ages were 11.9 in. TL and 22.4 in. TL, respectively.

Reproduction, Fecundity and Seasonality

No data are available from California. However, data from the western Pacific Ocean indicate that approximately one half of all male and female rock greenlings are sexually mature at age 3-4 and a length of 11.4 to 13.8 inches. In the Aleutian Islands, the spawning season extends from June through August. Females are oviparous, or egg-laying. Nest guarding by rock greenling has not been documented.

Natural Mortality

Estimates of natural mortality are not available.

Diseases

No information is available concerning diseases in rock greenling.

Predator/Prey Relationships

No information is available from California or on prey of larval rock greenling. No information is available on predators of rock greenling.

Competition

Based on co-occurrence with adult and juvenile rock greenling, demersal fishes associated with kelp beds and reef structure likely to compete with rock greenling for food and space would include lingcod, cabezon, kelp greenling, and rockfish species such as grass, China, quillback, copper, and vermilion.

Critical Habitat

Juveniles and adults frequent subtidal habitats in or around rocky reef areas and under kelp beds.

Status of Stocks

There are no estimates of abundance for rock greenling in California.